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EXAMINER	
YANG, ANDREW GUS	
ART UNIT	**PAPER NUMBER**
2628	

DATE MAILED: 03/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	10/810,064	WEST ET AL.	
	Examiner	Art Unit	
	Andrew Yang	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11 and 16-22* is/are rejected.

7)☒ Claim(s) *12-15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 1,2,3,4.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claim 13 is objected to because of the following informalities: it is unclear whether the first color component and second color components are selected exclusively from the sets: {red, green, blue}, {cyan, magenta, yellow}. Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 9 is rejected under 35 U.S.C. 101 because it is claiming a tangible media storing a representation of an image, which is nonfunctional descriptive material. See MPEP § 2106.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-8, 10-11, and 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable in view of Guo et al. (U.S. Patent No. 6,961,058).

With respect to claim 1, Guo et al. disclose a method for shadowing a lumislice, or cross-section of yarn (column 10, lines 31-32). Guo et al. disclose a first thickness

map by the function shown in Fig. 11b that determines whether light is partially absorbed by the yarn before reaching more distant positions (column 10, lines 43-45). It is noted that Guo et al. do not explicitly teach combining yarn to form multiple layers; however, it is well known that most items of yarn are made of more than one layer (i.e. a knit scarf). Therefore, it would have been obvious to form multiple layers of yarn, with multiple thickness maps corresponding to each strand of yarn, and each strand of yarn would have a thickness map including a plurality of thickness values corresponding to the layers of yarn occluding the light source because this would allow for Guo et al. to accurately determine lighting effects for most items made of yarn. Guo et al. does not explicitly teach determining the surface point on the object to be illuminated; however, this is a well known step for performing illumination calculations. It would have been obvious to determine a surface point on the object in order to perform illumination calculations with respect to the light source and use the thickness map corresponding to the selected surface point for said calculations because this would allow for Guo et al. to render the scene in response to the light source. Guo et al. disclose dividing an image slice into sub-slices so that shadow computation can be done at more points to improve the result quality (column 11, lines 7-9), resulting in filtered thickness values. It is noted that Guo et al. do not explicitly teach determining an illumination contribution from the first light source. However, this is well known to factor light sources into the scene, so it would have been obvious to determine an illumination contribution from the first light source in response to the first filtered thickness value in order to view the scene in response to lighting because lighting is necessary to view the scene.

With respect to claim 2, Guo et al. disclose the method of claim 1, wherein a thickness value versus absorption relationship in Fig. 11b determines whether light is partially absorbed by the yarn before reaching more distant positions (column 10, lines 43-45).

With respect to claim 3, Guo et al. disclose the method of claim 2; it is noted that Guo et al. do not explicitly teach that the first plurality of thickness values of the object with respect to the first lighting source vary in direction away from the first lighting source. However, this step would have been obvious because yarn cross sections further away from the light source are occluded by closer yarn cross sections from the same piece of cloth, resulting in greater thickness values.

With respect to claim 4, Guo et al. disclose the method of claim; it is noted that Guo et al. do not explicitly teach determining a first plurality of thickness values of the object between the first lighting source and the plurality of surface points in the respective directions. However, this step would have been obvious in order to light all surface points of the entire object.

With respect to claim 5, Guo et al. disclose the method of claim 2, wherein it would have been obvious to determine a second thickness map for a second lighting source because it is well known to include multiple light sources to illuminate a scene. Claim 5 includes similar steps in claim 1 directed towards a first light source; see rationale for rejection of claim 1.

With respect to claim 6, Guo et al. disclose the method of claim 5. Guo et al. do not explicitly teach two light sources. However, it is well known in the art that may

rendered scenes use multiple light sources. Therefore, it would have been obvious to determine a shading value for a surface point on the object in response to the first, second, or first and second light source illumination contributions because this would allow for properly rendering the scene in response to multiple light sources.

With respect to claim 7, Guo et al. disclose the method of claim 5; it is noted that Guo et al. do not explicitly teach determining a shading value or pixel value. Determining shading values and pixel values is well known in the art, so it would have been obvious to determine a shading value for a surface point in response to the illumination contribution from the first lighting source and pixel value in response to the shading value because this would properly render the scene. It is noted that Guo et al. do not teach storing the image on tangible media. However, is well known to store images on tangible media; therefore it would have been obvious for Guo et al. to store the image because it would allow for accessing a previously rendered image.

With respect to claim 8, Guo et al. disclose the method of claim 7. Guo et al. disclose a monitor 1742 in Fig. 17 or other type of display device (column 15, line 30). Although Guo et al. do not explicitly teach outputting the image from a tangible media to one or more viewers; it is well known to use display devices to output such images and images can be read from tangible media. Therefore, it would have been obvious for Guo et al. to use the display device to output the image from tangible media because this would allow the user to view stored images.

With respect to claim 10, Guo et al. disclose a computer system 1702 in Fig. 17 (column 14, line 11) including system memory 1706 in Fig. 17 and a processor 1704 in

Fig. 17 coupled to the system memory (column 14, lines 13-15) for performing the method as in claim 1 (see rationale for rejection of claim 1).

With respect to claim 11, Guo et al. disclose the system of claim 10, wherein a thickness value versus transmission relationship in Fig. 11b that determines whether light is partially absorbed by the yarn before reaching more distant positions (column 10, lines 43-45). Guo et al. do not explicitly disclose configuring the memory and processor; however the usages of these components are well known in the art for data storage and calculations. Therefore, it would have been obvious to configure the memory to store the relationship and it would have been obvious to configure the processor for determining the illumination contribution in response to the filtered thickness value and said relationship because this would provide convenient access when processing data for rendering and for properly rendering the scene.

With respect to claim 16, Guo et al. disclose the system of claim 10. Guo et al. do not explicitly disclose using the processor to determine a shading value; however, using a processor for determining a shading value is well known in the art. Therefore, it would have been obvious to configure the processor for determining a shading value for a surface point in response to the illumination contribution from a first light source for the system to account for lighting in order to properly render the scene.

With respect to claim 17, Guo et al. disclose a computer program product for implementing the system and method in the general context of computer executable instructions, such as program modules (column 16, lines 22-25) wherein the implementation of the system and method is stored on or transmitted across some form

of computer readable media (column 16, lines 60-61). Claim 17 is directed towards a computer program product form implementing the method of claim 1; see rationale for rejection of claim 1.

With respect to claim 18, Guo et al. disclose the computer program product of claim 17 for implementing the method in claim 2; see rationale for rejection of claim 2.

With respect to claim 19, Guo et al. disclose the computer program product of claim 18. As in the rationale of the rejection of claim 1, the first plurality of thickness values comprise of yarn occluding the first illumination source and the surface point and surface points in a neighborhood of the surface point.

With respect to claim 20, Guo et al. disclose the computer program product of claim 18, wherein a thickness value versus absorption relationship in Fig. 11b determines whether light is partially absorbed by the yarn before reaching more distant positions (column 10, lines 43-45). Although Guo et al. do not explicitly disclose the selection of red, green, or blue as a primary component of light; such light component colors are well known in the art. Therefore, it would have been obvious to select a primary component of light from red, green, or blue because this would provide a selection of light as desired by the user.

With respect to claim 21, Guo et al. disclose the computer program product of claim 19 for implementing the first step of claim 1; see rationale for rejection of claim 1.

With respect to claim 22, Guo et al. disclose the computer program product of claim 20 for implementing the method in claim 7; see rationale for rejection of claim 7.

Allowable Subject Matter

Claims 12-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to further show the state of the art with rendering shadows:

U.S. Patent No. 6,897,865 to Higashiyama for rendering shadows with density.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Yang whose telephone number is (571) 272-5514. The examiner can normally be reached on 8:30-5 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman can be reached on (571) 272-7653. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AGY

3/20/06

MARK ZIMMERMAN
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